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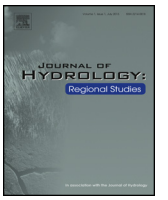

Peer review report 2 on UNCERTAINTY ON RUNOFF PROJECTIONS UNDER CHANGING CLIMATE IN WAMI RIVER SUB-BASIN

Original Submission

Recommendation

Major Revision

Comments to the author

Summary

The authors present in this paper a good example how a wide range of GCMs can be used to model the possible impact to a regional hydrological system. Thereby the authors consider the uncertainty from the climatological scenarios to the hydrological system. This paper is worth to be published for further scientific use. However, there are issues that need to be addressed as outlined below before the manuscript can be published.

General remark

I consider the high number and the form of figures appropriate. But the text body could be shortened on some places. Later I give some specific comments. The plates of figure and tables could be longer.

The previously published paper of the first author (Wambura, F. J., 2014. Stream Flow Response to Skilled and Non-linear Bias Corrected GCM precipitation change in the Wami River Sub-basin, Tanzania. British Journal of Environment and Climate Change, 4(4), pp. 389–408. doi:10.9734/BJECC/2014/13457.) contains many similarities to the actual paper. Maybe the authors can refer a bit more to this paper to shorten and straighten.

Specific comments

Line 48: can you write “physically based distributed model”. As you apply the physical approaches to your 45 sub-catchments for 41000 km^2 with I do not know how many HRUs, the approaches become more conceptual.

Line 72: There is no GCM correct! They all show potential possible futures but not the real future!

DOI of the original article:http://dx.doi.org/10.1016/j.ejrh.2015.05.013.

2214-5818/$ – see front matter
http://dx.doi.org/10.1016/j.ejrh.2015.06.001

Line 145: 34 years with how many gaps? (you talk only in Fig. 2 about missing data)

Line 155: Can you say how many HRUs?

Line 156: How did you interpolate the observed rainfall to the sub-catchments?

Line 211: Why your threshold is 75%?

Line 213–229: Can this be shortened? The RCPs are already described in detail in other publications.

Line 246: Driest and wettest referred to rainfall or (rainfall -reference evapotranspiration) as used in some climate scenarios?

Line 269: I understand the definition of uncertainty in this context of the fuzzy approach. But for me 100% uncertainty referring to climate scenarios or hydrological modelling is something different. Especially when you only use 6 GCMs. Maybe you can discuss this or point out the differences. "100% uncertainty" is already used in the abstract.

Line 275: If the water consumption increases I assume also a land use/land cover change. As the priority in this paper is in uncertainty of climate change it is not necessary to consider it in the model, but at least a short mention/discussion would be suitable.

Line 289: It seems to me, that there is a decrease of floods in validation period compared to calibration period, might this be a reason for better NSE?

Line 359–382: In my opinion the single description of the GCMs is not necessary. The figures explain it well, if the reader is interested in single GCM performance.

Line 388–390: this sentence is not necessary.

Line 391–407: Similar to line 359–382: in my opinion the single description of the GCMs is not necessary. The figures explain it well, if the reader is interested in single GCM performance. Better you extent the overall discussion in Line 411–414.

Line 405: Change "815" to "81%"!

Line 422: Change "200" to "2010"!

Line 426–461: Describes in my opinion again to much the single GCMs.

Line 426–438: As you show percentage change in Fig. 8, small absolute changes in the drier period (September) could be overestimated?!

Line 475: Could this November-values be triggered by an uncertainty (shift) in the begin of the wet season?

Line 529: Could you write the 113% in absolute values (m^3/s) to make it comparable to runoff.

Table 1: could you use (m^3/s) to make it comparable to runoff, also for projected demand and column with a sum over the users.

Figure 1: Change "Streamsflow" to "Streamflow". Why you don't use more common (rounded) class boundaries?

Figure 5: Is 2010 right and not 2009?

Figure 8 & 9: Is the basis of change 1980–2009? Please clarify in figure or plate.

Figure 11 & 12: can you change "cumecs" to "m^3/s" or "cms".

First Revision

Recommendation

Accept

Comments to the author

The authors improved the paper significantly and fulfilled all recommendations. With this I suggest to accept the paper.

Anonymous reviewer 2

Available online 15 June 2015